

# Chapter 7

## WILDLIFE

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### 7.1 INTRODUCTION

The native wildlife community is a natural and integral component of the Lake Tahoe ecosystem. At least 289 terrestrial and semi-terrestrial vertebrates occur in the Lake Tahoe Basin as residents or regular visitors (Murphy and Knopp 2000), including 217 birds, 59 mammals, 5 amphibians, and 8 reptiles. An additional 57 terrestrial species have been recorded in the basin as accidental visitors or as potentially extirpated species from the basin (Murphy and Knopp 2000). Consequently, the Lake Tahoe Basin provides environmental conditions and habitats conducive to providing for a relatively diverse list of species with opportunities to fulfill their respective life history requirements.

In general, wildlife requires specific habitat elements such as food, cover, water, and space to survive and reproduce. The availability of essential habitat elements is dynamic and varies in time and space, and the suitability of a habitat or a combination of habitats is dependant on a species' life history requirements. Understanding the relationship between wildlife and habitat, the processes that create habitat and the life history requirements of a wide diversity of wildlife species is at the heart of sound wildlife planning and management. In addition to physical habitat attributes, additional factors such as predators, parasites, competitors, and disease can cause habitat degradation. Also, human disturbance through recreational activities can make an area unsuitable for occupancy by many wildlife species. Thus, the evaluation of habitat suitability must include both the direct (e.g., physical structure, food) and indirect (e.g., disturbance, predation) factors impacting wildlife.

The goals of TRPA threshold standards for the Tahoe Region wildlife resources are to improve riparian habitat and sustain Special Interest Species populations at or above threshold standard levels. To achieve this goal, two threshold standards and associated indicators have been adopted, including: a non-degradation standard for riparian habitat and providing for a minimum number of population sites for a list of Special Interest Species. Functionally, the Special Interest Species evaluation requires an attainment assessment of seven different standards (see discussion below). This section reports on progress made towards achieving adopted Threshold Standards for wildlife, evaluates the effectiveness of TRPA's Regional Plan for achieving Threshold Standards, and proposes a new approach to measure the biological integrity of terrestrial and aquatic ecosystems and the status of a suite of special status species.

## 7.2 BACKGROUND

In recognition of the importance of natural resources (including wildlife) to environmental quality in the Lake Tahoe Basin, the Tahoe Regional Planning Compact established the framework from which the TRPA Regional Plan was created and the adopted environmental threshold carrying capacities (“thresholds” or “threshold standards”) for wildlife. The Regional Plan consists of several documents, two of which, the Goals and Policies (TRPA 1986) and the Code of Ordinances and Rules of Procedure (TRPA 1987), provide relevant policy statements for the maintenance of wildlife threshold standards.

According to the Wildlife Sub-element of the Goals and Policies, there are two goals and five policy statements relative to maintaining wildlife resources. The goals are: 1) Maintain suitable habitat for all indigenous species of wildlife without preference to game or non-game species through maintenance of habitat diversity; and 2) Preserve, enhance, and, where feasible, expand habitats essential for threatened, endangered, rare, or sensitive species found in the basin. The five policies are that TRPA must: 1) consider and mitigate project impacts to wildlife; 2) protect riparian vegetation; 3) forbid the release of non-native species; 4) control and contain domestic animals; and 5) protect sensitive species and buffer them against conflicting land uses.

TRPA's Code of Ordinances (Code) provides more specific language pertaining to the protection of sensitive wildlife species and their habitats. The core of TRPA's wildlife regulations is detailed in Code Chapter 78 “Wildlife Resources”; however, applicable regulations for the management of wildlife habitats can be found throughout the document. Protection measures for perching and nesting sites of Northern Goshawks (*Accipiter gentilis*), Peregrine Falcons (*Falco peregrinus anatum*), Bald Eagles (*Haliaeetus leucocephalus*), Golden Eagles (*Aquila chrysaetos*), and Ospreys (*Pandion haliaetus*) are outlined in Chapter 78. Details for mule deer (*Odocoileus hemionus*) fawning habitat and migration corridor protection are also found in Chapter 78. Essentially, wildlife habitat within disturbance (free) zones and movement corridors is provided protection from being impacted by conflicting land uses. Accordingly, only projects or activities that enhance wildlife habitat are allowed within disturbance (free) zones of TRPA designated Special Interest Species and a non-degradation standard is applied to movement corridors and riparian habitat due to this habitat's potential to provide suitable conditions for a relatively great diversity of species compared to other habitats. Additionally, Chapter 78 provides protection to new population areas (equivalent to a new viable nest or den site) of listed Special Interest Species as they are discovered and for additional species designated by other agencies, as their population levels become a concern. Although the Code provides protection, neither Chapter 78 nor Goals and Policies identify specific management goals for sensitive species listed by other agencies (i.e., no minimum number of population sites).

## **7.2.1 MEASUREMENT AND MONITORING OF INDICATORS AND STANDARDS**

The Wildlife sub-element of the Conservation Element of the Goals and Policies identifies wildlife threshold standards and presents a general policy direction for the maintenance and enhancement of wildlife resources. Two threshold standards are identified for wildlife: 1) provide a minimum number of Special Interest Species population sites (W-1); and 2) apply a non-degradation standard to habitats of special significance consisting of deciduous trees, wetlands, and meadows while providing opportunities to increase the acreage of such riparian associations (W-2). The foundation of the Species Interest Species threshold is the protection of native wildlife species that are aesthetically pleasing to residents and visitors, and/or are especially vulnerable to extirpation (Table 7-1, TRPA 1982a). The Special Interest Species threshold is numerical as it identifies minimum numbers of population sites for each species (or group of species, such as waterfowl) that must be maintained in order for the threshold standard to be in compliance (TRPA 1982b). The basis of the 'Habitats of Special Significance' threshold is to provide protection to riparian habitat, which on a relative scale provides habitat for the greatest number of common species. The locations of Special Interest Species population sites were identified on TRPA Map Overlays (1987) and in the *Environmental Impact Statement for the Establishment of Environmental Threshold Carrying Capacities* (1982b). These maps however did not identify the location or baseline acreage of Habitats of Special Significance. Below are indicators and standards cited directly from the 2001 TRPA Threshold Evaluation (compliance forms).

### **W-1 Special Interest Species**

#### ***W-1 Indicators***

The minimum number of population sites (areas for reproductive activity or wintering habitat) and disturbance (free) zones maintained as determined by inspection by qualified wildlife experts using measures of reproductive activity or habitat quality.

#### ***W-1 Standard***

Provide a minimum number of population sites and disturbance zones for the following species or species groups (listed in Table 7-1). Nest sites and perch sites shown on TRPA Regional Plan Overlay Maps or in TRPA Geographic Information System shall not be physically disturbed, nor shall the habitat in the disturbance zone be manipulated in any manner, unless necessary to enhance the quality of the habitat (TRPA Code, Chapter 78, Subsection 78.3.A).

**Table 7-1: TRPA’s List of Special Interest Species, Associated Indicators and Standards of Population Condition.**

Species	Minimum # of Population Sites Maintained	Disturbance (free) Zone (radius, mi.)
Northern Goshawk ( <i>Accipiter gentilis</i> )	12	0.50
Osprey ( <i>Pandion haliaetus</i> )	4	0.25
Bald Eagle (winter) ( <i>Haliaeetus leucocephalus</i> )	2	Mapped
Bald Eagle (nesting)	1	0.50
Golden Eagle ( <i>Aquila chrysaetos</i> )	4	0.25
Peregrine Falcon ( <i>Falco peregrinus anatum</i> )	2	0.25
Waterfowl (wetland associated species)	18	Mapped
Deer ( <i>Odocoileus hemionus</i> )	-	Meadows

The TRPA, along with the US Forest Service – Lake Tahoe Basin Management Unit (USFS-LTBMU), California State Parks, and the Nevada Division of Wildlife, annually coordinate wildlife survey efforts and data. Collectively, these agencies work together in order to generate quality information on the status of several wildlife species and habitats throughout the basin. Since 1997, this interagency effort has closely coordinated field efforts; using established and accepted survey protocols, to efficiently, and consistently record information on the basin’s wildlife populations. In addition to wildlife surveys, the interagency group continues to develop a wildlife database in which all agency partners can contribute survey data. The data can be queried to rapidly generate pertinent wildlife information. As part of the data management effort, the interagency monitoring program continues to develop a Geographic Information System (GIS) for wildlife sightings, population activity locations (i.e., nest and den location), and habitats of significance.

Data from annual surveys and other relevant research was used to evaluate the status of Special Interest Species for this evaluation. Table 7-2 summarizes the indicators used to assess whether the region was in attainment with respect to the Threshold Standard.

**Table 7-2: Indicators Used to Evaluate Special Interest Species Population Site Status.**

<b>Species</b>	<b>Status Indicator</b>
Northern Goshawk	Number of Reproductively Active Territories – Territories where an active nest site was documented or juveniles were observed.
Osprey	Number of Nests with Well-developed Young – Number of nests where fledglings were recorded toward the end of the nest cycle, fully feathered and/or branched.
Bald Eagle (winter)	Annual Winter Population Count – Total number of adult and juveniles eagles recorded during annual winter surveys.
Bald Eagle (nesting)	Number of Active Nests with Chicks
Golden Eagle	Insufficient Data - Not evaluated
Peregrine Falcon	Insufficient Data - Not evaluated
Waterfowl	Species richness and relative % composition of bird assemblages
Deer	Annual Nevada Department Of Wildlife (NDOW) Fall and Spring Deer Counts

**W-2 Habitats of Special Significance**

***W-2 Indicators***

Area of naturally functioning SEZs (acres)

***W-2 Standard***

A nondegradation standard shall apply to significant wildlife habitat consisting of deciduous trees, wetlands, and meadows while providing for opportunities to increase the acreage of such riparian associations. The W-2 wildlife standard is also reflected in the soil conservation SC-2 Standard: Preserve existing natural functioning Stream Environment Zone (SEZ) lands in their natural hydrologic condition, restore all disturbed SEZ in undeveloped, unsubdivided lands, and restore 25 percent of the SEZ lands that have been identified as disturbed, developed or subdivided, to attain a 5 percent total increase in the naturally functioning SEZ land.

Originally, TRPA (1986) adopted a non-degradation threshold standard for riparian habitat. No numerical goals (such as acres restored) were originally identified for this threshold standard. However, past threshold evaluations (1991, 1996, and 2001) have used the SC-2 standard to evaluate the status of riparian habitat. A 20-year target of restoring 25 percent of disturbed sites within urban boundaries and 100 percent of disturbed sites outside urban boundaries was set for attaining the threshold standard for Stream Environment Zone (See SC-2 in the Soil

Conservation Chapter in this Evaluation). Combined, it was estimated that 1,100 acres of riparian habitat were to be restored by 2007.

## 7.3 THRESHOLD STATUS

### 7.3.1 W-1 SPECIAL INTEREST SPECIES

#### Status of Indicators

##### Not in attainment

Overall, the status of two species (Golden Eagle and Peregrine Falcon) is unknown, 5 indicators imply non-attainment (Northern Goshawk, Bald Eagle [nesting and wintering], waterfowl, and deer), and the status of one species (Osprey) is in attainment with established species-specific standards. Consequently, the Threshold for Special Interest Species is **not in attainment** (Table 7-3).

Several factors that likely contribute to this finding include:

- 1) Some species-specific standards are not achievable (e.g., peregrine falcon),
- 2) Direct and indirect degradation of habitat conditions resulting from:
  - Over-use of disturbance (free) zones by recreationists,
  - Factors occurring outside of the region (e.g., subdivision, development, transportation infrastructure) that impact migration corridors (e.g., deer),
  - Domestic and alien species occurring at disturbance (free) zones, and
  - Direct effects associated with forest thinning operations.
- 3) Lack of “non-degradation” policy enforcement in disturbance (free) zones.

**Table 7-3: Summary of Special Interest Species Threshold Standard Attainment and Trends (↑ = improving, ↔ = stable, ↓ = declining), 1991 to 2006.**

<i>W-1 Species Interest Species</i>	<i>1991 Attain Status</i>	<i>1996 Attain Status</i>	<i>2001 Attain Status</i>	<i>2006 Attain Status</i>
<b>Northern Goshawk</b>	Unknown	Attainment	Non-Attainment	Non – attainment, Near attainment, ↑
<b>Osprey</b>	Attainment	Attainment	Attainment	Attainment, ↑
<b>Bald Eagle - Nesting</b>	Non-Attainment	Attainment	Attainment	Non-Attainment, ↓
<b>Bald Eagle - Wintering</b>	Attainment	Attainment	Non-Attainment	Non-Attainment, Near Attainment ↔
<b>Golden Eagle</b>	Unknown	Unknown	Non-Attainment	Unknown
<b>Peregrine Falcon</b>	Unknown	Non-Attainment	Non-Attainment	Unknown
<b>Waterfowl</b>	Attainment	Attainment	Non-Attainment	Non-Attainment, ↓
<b>Deer</b>	Attainment	Attainment	Non-Attainment	Non-Attainment, ↓

The following text provides a synthesis of the status of each Special Interest Species relative to its established standard.

## **Northern Goshawk**

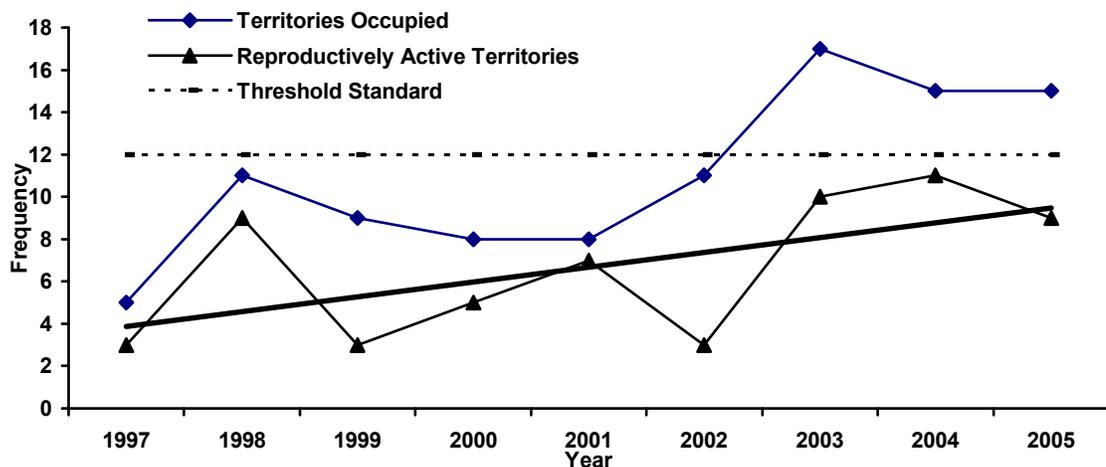
### **Non – attainment, near attainment**

Nest activity data collected in years 1997 through 2005 on Lake Tahoe's Northern Goshawk population were used to assess their status. For the last 9 years of survey effort, the following Northern Goshawk population activity was recorded:

- An average of 11 occupied territories detected per year (range 5 to 17/year),
- An average of 6.67 reproductively active territories detected per year (range 2 to 10/year),
- An average of 5.33 fledglings detected per year (range 2 to 11/year)

Since the last evaluation, the number of detections of reproductively active territories has increased (Figure 7-1). In any one year (even since improved survey effort has been implemented), the region has not reached the threshold standard of 12 reproductively active territories. Within the past 5 years, direct effects associated with forest thinning operations (e.g., skidding, felling, placement of stages areas) were suspected of causing two territories to fail to successfully fledge young.

**Figure 7-1: Summary of Documented Northern Goshawk Territory Activity, 1997 - 2005, Lake Tahoe CA, NV. Straight black line represents linear trend of number of reproductively active territories.**



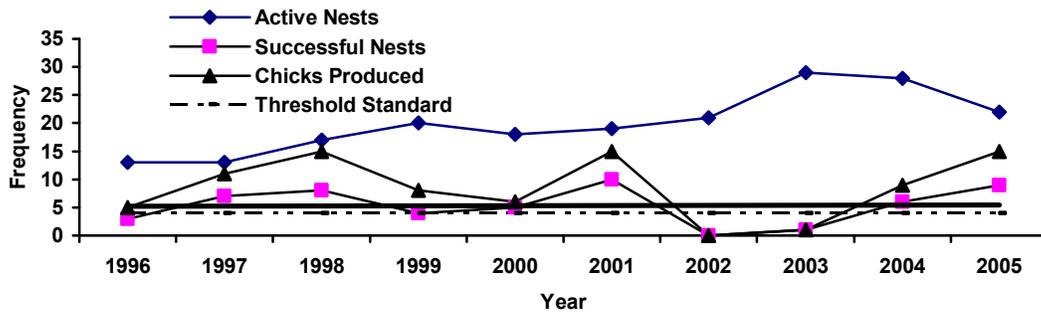
## **Osprey**

### **Attainment**

*Nest Activity:* In general, Ospreys build large and conspicuous nests in the tops or side-branches of relatively large and dead trees in close proximity to shorelines of large water bodies in the Tahoe region. Consequently, monitoring Osprey reproductive activity is fairly straightforward and allows for relatively accurate documentation of nest productivity. Since 1996, the region has met the minimum threshold standard in each year (Figure 7-2). Since 1996 the following observations of Osprey reproductive activity were recorded:

- $20 \pm 5.4$  (Mean  $\pm$  SD) nests were active/year, of which an average of  $5.3 \pm 2$  nests per year produced well-developed chicks (fledged or near fledging age). Throughout the basin Ospreys produced an average of  $8.5 \pm 5.6$  chicks per year. The threshold standard for number of nest that produced chicks to fledging age was not attained in 2002 and 2003 (See Figure 7-2) however overall, the species-specific standard is in attainment for the region.

**Figure 7-2: Summary of Osprey Nest Activity Relative to TRPA Threshold and Population Trend, Lake Tahoe, CA, NV, 1996 to 2005. Straight black line represents linear trend of number of successful nest.**



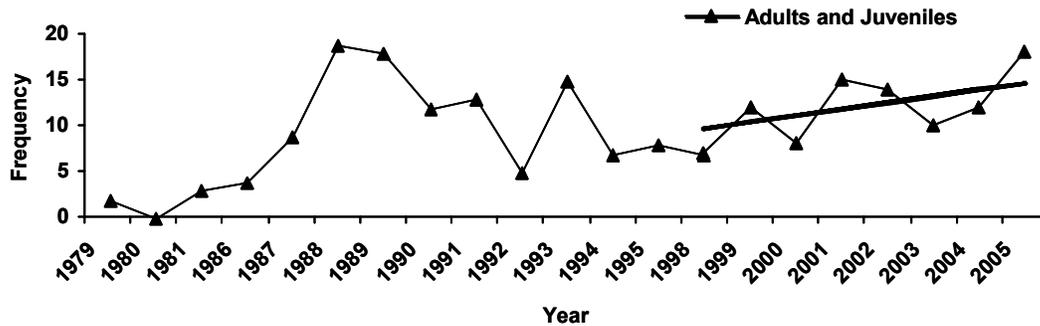
***Bald Eagle (Wintering)***  
**Non-Attainment, Near Attainment**

The number of Bald Eagles counted during annual winter surveys between 1998 and 2005 appears to be increasing (Figure 7-3). Since 1998, the following observations of wintering Bald Eagle activity were recorded (Mean  $\pm$  SD):

- $9.5 (\pm 3.16)$  Adults detected per year,
- $2 (\pm 1.69)$  Juveniles detected per year,
- $12 (\pm 3.66)$  Total individuals per year

Areas allocated for wintering bald eagle continued to be impacted by recreational activities during winter season. Land managers could improve enforcement of area closures.

**Figure 7-3: Number of Juvenile and Adult Bald Eagles Detected During Winter Surveys, 1979 - 2005, Lake Tahoe, CA, NV.\* Straight black line represents linear trend of the number of bald eagle detections based on data collected after 1998.**



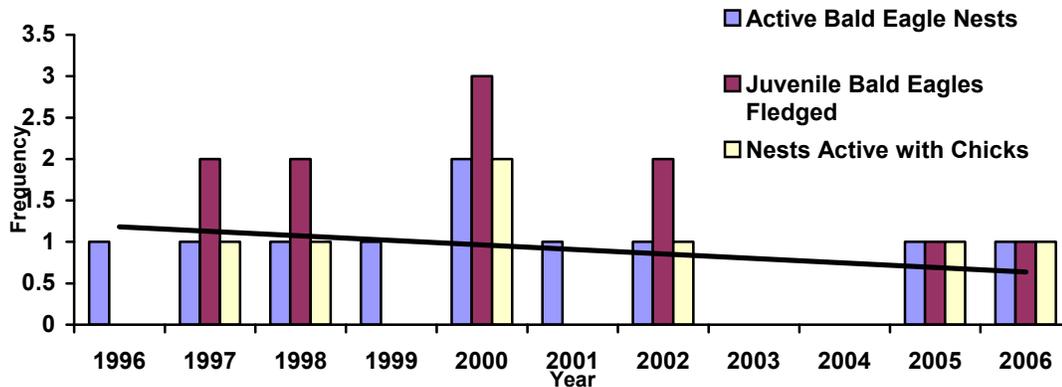
\*Data collected between 1998 and 2005 is not comparable to data collected prior to 1998. For data collected between 1998 and 2005, count data were scrutinized in order to flesh out individuals that were counted >1 time during the survey. Additionally, juvenile Bald Eagles were recorded independently from adults. It is unknown what protocol was used to assess data collected prior to 1998.

### ***Bald Eagle (Nesting)*** **Non-Attainment**

Over the last 10 years, the number of active Bald Eagle territories has not met the goal of the Pacific Bald Eagle Recovery Plan (USFWS 1986) of 4 nest territories or an average active success rate per occupied territory of 65 percent for the Lake Tahoe region (Zone 28). However, the nesting population is achieving the Plan's average reproductive rate goal of producing 1 fledged young per pair per year (USFWS 1986). Between 1996 and 2005, basin agencies have documented 3 separate Bald Eagle nest sites.

On average,  $1 \pm 1.15$  ( $\bar{x} \pm SD$ ) chicks have fledged per pair per year with an average annual territory success rate of 50% when nests are documented as active. The minimum threshold standard for active Bald Eagle nest sites has been met or exceeded in 3 of the last 5 years (Figure 7-4). The average annual number of active nests was 0.4 active nest/year between 2001 and 2006, a decline from the previous evaluation period and below the threshold standard of one active nest per year. Overall, there is a declining trend for all measures of reproductive activity (Figure 7-4).

**Figure 7-4: Summary of Bald Eagle Nest Activity and Population Trend 1996 to 2006, Lake Tahoe, CA, NV Straight black line represents linear trend of number of nests active with chicks.**



### ***Peregrine Falcon & Golden Eagle*** **Unknown**

Due to limited information on nest activity and observation of these species in the region, it is inappropriate to speculate on a population trend for nesting Golden Eagle and Peregrine Falcon. Habitat suitability for both species in the region is marginal based on historic use and the region's high elevation relative to areas typically used by the two species within their range.

### ***Waterfowl*** **Non-Attainment**

Threshold wetland sites located on the western, eastern, and southern portions of the Lake Tahoe Basin (n=19) were surveyed annually between 1999 and 2003. Sample sites were established at each wetland (n=1-2, depending on wetland size) such that a large majority of the wetland area was viewable and not obscured by vegetation or topography. Three to four one-hour long unlimited distance breeding bird surveys were conducted at each sample site between 0500 and 1800 hours.

The biological integrity of the wetland bird community was evaluated by examining the relative percent contribution of wetland bird assemblages to the overall species richness of birds expected to breed in the Lake Tahoe Basin (Table 7-4; Orr and Moffitt 1971). Migrant bird species were not included in the evaluation because changes in migrant bird populations are confounded by regional environmental factors, not local wetland conditions per se.

Four bird assemblages were used in the evaluation: detrimental, songbirds, waterbirds, and waterfowl (Table 7-5). The common thread connecting these assemblages was a relevance to human disturbance and a dependency on wetland habitat for one or more life stage components (i.e., only nests in emergent wetland vegetation). The detrimental bird assemblage contains predatory bird species in the Corvidae family and invasive species such as the European Starling,

a cavity nest robber, and the Brown-headed cowbird, a nest parasite that negatively impacts songbird fecundity. These detrimental bird species respond positively to the direct (i.e., increased land coverage and recreational disturbance) and indirect (i.e., forest fragmentation) affects of human disturbance. A healthy, biologically intact wetland system should not contain a higher proportion of detrimental bird species compared to desirable bird species.

The songbird, waterbird, and waterfowl assemblages all contain desirable bird species that are sensitive to human disturbance. These bird species have historically bred and should still be breeding in the Lake Tahoe Basin if healthy significantly unaltered wetland habitat is available. For example, the bird composition in wet meadow or marsh edge should consist of a high proportion of wetland shrub obligate species such as the Willow Flycatcher, Wilson Warbler, and Yellow Warbler. A healthy undisturbed freshwater emergent marsh should contain secretive marsh birds such as rails and bitterns, colonial waterbirds such as the Black-crowned Night Heron, and waterfowl like the Ring-neck Duck.

Species richness, calculated as an average within wetland type, year and assemblage, was the primary variable of interest used in the evaluation. Wetlands in the Lake Tahoe Basin were assigned to one of four types: marsh (n=4) wet meadow (n=3), lake (n=4;  $\geq 100$  acres of open water), and pond (n=8; <100 acres of open water).

**Table 7-4: Breeding Birds in the Lake Tahoe Basin (Orr and Moffit 1971).**

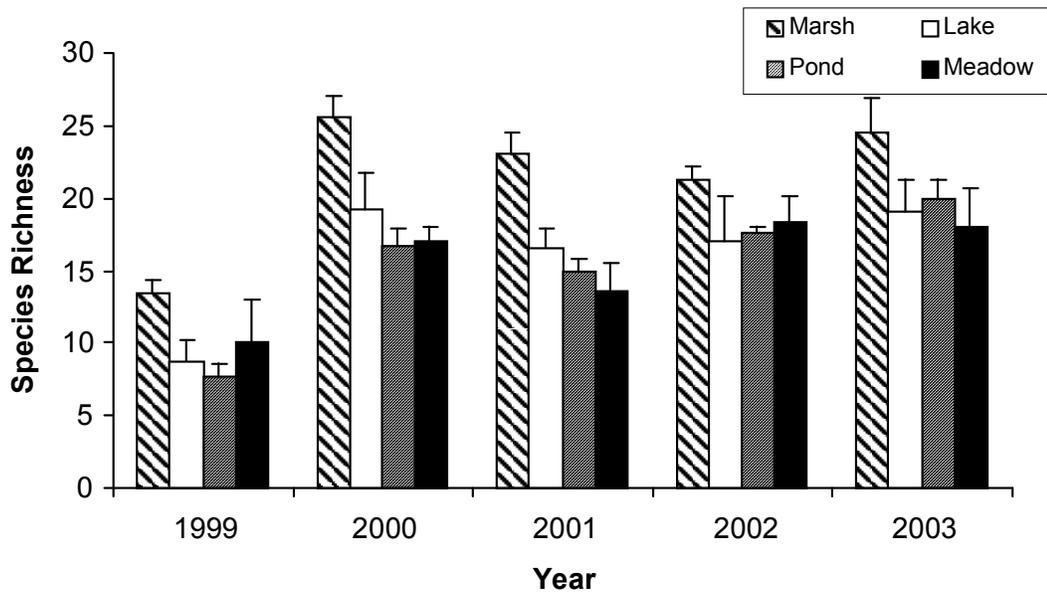
Common Name	Genus	Species
American Bittern	<i>Botaurus</i>	<i>lentiginosus</i>
American Coot	<i>Fulica</i>	<i>americana</i>
American Dipper	<i>Cinclus</i>	<i>mexicanus</i>
Bald Eagle	<i>Haliaeetus</i>	<i>leucocephalus</i>
Barn Swallow	<i>Hirundo</i>	<i>rustica</i>
Belted Kingfisher	<i>Ceryle</i>	<i>alcyon</i>
Black Tern	<i>Childonias</i>	<i>niger</i>
Black-Billed Magpie	<i>Pica</i>	<i>pica</i>
Brewer's Blackbird	<i>Euphagus</i>	<i>cyranocephalus</i>
Brewer's Sparrow	<i>Spizella</i>	<i>breweri</i>
Brown-Headed Cowbird	<i>Molotrus</i>	<i>ater</i>
Buffelhead	<i>Bucephala</i>	<i>albeola</i>
California Gull	<i>Larus</i>	<i>californicus</i>
Calliope Hummingbird	<i>Stellula</i>	<i>calliope</i>
Canada Goose	<i>Branta</i>	<i>canadensis</i>
Cassin's Vireo	<i>Vireo</i>	<i>cassinii</i>
Chipping Sparrow	<i>Spizella</i>	<i>passerina</i>
Cinnamon Teal	<i>Anas</i>	<i>cyanoptera</i>
Cliff Swallow	<i>Petrochelidon</i>	<i>pyrrhonota</i>
Common Merganser	<i>Mergus</i>	<i>merganser</i>
Common Raven	<i>Corvus</i>	<i>corax</i>
Dark-Eyed Junco	<i>Junco</i>	<i>hyemalis</i>
Downy Woodpecker	<i>Picoides</i>	<i>pubescens</i>
Dusky Flycatcher	<i>Empidonax</i>	<i>overholseri</i>

Common Name	Genus	Species
Eared Grebe	<i>Podiceps</i>	<i>nigricollis</i>
European Starling	<i>Sturnus</i>	<i>vulgaris</i>
Forster's Tern	<i>Sterna</i>	<i>forsteri</i>
Fox Sparrow	<i>Passerella</i>	<i>iliaca</i>
Hairy Woodpecker	<i>Picoides</i>	<i>villosus</i>
Hammonds' Flycatcher	<i>Empidonax</i>	<i>hammondii</i>
Hermit Warbler	<i>Dendroica</i>	<i>occidentalis</i>
House Wren	<i>Troglodytes</i>	<i>aedon</i>
Killdeer	<i>Charadrius</i>	<i>vociferus</i>
Lazuli Bunting	<i>Passerina</i>	<i>amoena</i>
Least Bittern	<i>Ixobrychus</i>	<i>exilis</i>
Lewis' Woodpecker	<i>Melanerpes</i>	<i>lewis</i>
Lincoln's Sparrow	<i>Melospiza</i>	<i>lincolnii</i>
Macgillivray's Warbler	<i>Oporornis</i>	<i>tolmiei</i>
Mallard	<i>Anas</i>	<i>platyrhynchos</i>
Marsh Wren	<i>Cistothorus</i>	<i>palustris</i>
Nashville Warbler	<i>Vermivora</i>	<i>ruficapilla</i>
Northern Pintail	<i>Anas</i>	<i>acuta</i>
Orange-crowned Warbler	<i>Vermivora</i>	<i>celata</i>
Osprey	<i>Pandion</i>	<i>haliaetus</i>
Pied-Billed Grebe	<i>Podilymbus</i>	<i>podiceps</i>
Redhead	<i>Aythya</i>	<i>americana</i>
Red-Winged Blackbird	<i>Agelaius</i>	<i>phoeniceus</i>
Ring-necked Duck	<i>Aythya</i>	<i>collaris</i>
Rock Wren	<i>Salpinctes</i>	<i>obsoletus</i>
Ruddy Duck	<i>Oxyura</i>	<i>jamaicensis</i>
Savannah Sparrow	<i>Passerculus</i>	<i>sandwichensis</i>
Song Sparrow	<i>Melospiza</i>	<i>melodia</i>
Sora	<i>Porzana</i>	<i>carolina</i>
Spotted Sandpiper	<i>Actitis</i>	<i>macularia</i>
Steller's Jay	<i>Cyanocitta</i>	<i>stelleri</i>
Tree Swallow	<i>Tachycineta</i>	<i>bicolor</i>
Virginia Rail	<i>Rallus</i>	<i>limicola</i>
Warbling Vireo	<i>Vireo</i>	<i>gilvus</i>
Western Meadowlark	<i>Sturnella</i>	<i>neglecta</i>
Western Tanager	<i>Piranga</i>	<i>ludoviana</i>
Western Wood-Pewee	<i>Contopus</i>	<i>sordidulus</i>
White-breasted Nuthatch	<i>Sitta</i>	<i>carolinensis</i>
White-crowned Sparrow	<i>Zonotrichia</i>	<i>leucophrys</i>
White-headed Woodpecker	<i>Picoides</i>	<i>alboarvatus</i>
Williamson's Sapsucker	<i>Sphyrapicus</i>	<i>thyroideus</i>
Willow Flycatcher	<i>Empidonax</i>	<i>trillii</i>
Wilson's Phalarope	<i>Phalaropus</i>	<i>tricolor</i>
Wilson's Snipe	<i>Gallinago</i>	<i>gallinago</i>
Wilson's Warbler	<i>Wilsonia</i>	<i>pusilla</i>
Yellow Warbler	<i>Dendroica</i>	<i>petechia</i>
Yellow-bellied Sapsucker	<i>Spyrapicus</i>	<i>varius</i>
Yellow-headed Blackbird	<i>Xanthocephalus</i>	<i>xanthocephalus</i>
Yellow-rumped Warbler	<i>Dendroica</i>	<i>coronata</i>

**Table 7-5: Bird Species Assemblages Used to Evaluate Wetland Integrity.**

<b>Bird Assemblage</b>	<b>Common Name</b>	<b>Genus</b>	<b>Species</b>
Detrimental	Brown-headed Cowbird	<i>Molotrus</i>	<i>ater</i>
	Common Raven	<i>Corvus</i>	<i>corax</i>
	European Starling	<i>Sturnus</i>	<i>vulgaris</i>
	Steller's Jay	<i>Cyanocitta</i>	<i>stelleri</i>
Songbirds	Lazuli Bunting	<i>Passerina</i>	<i>amoena</i>
	Lincoln's Sparrow	<i>Melospiza</i>	<i>lincolnii</i>
	Macgillivray's Warbler	<i>Oporornis</i>	<i>tolmiei</i>
	Warbling Vireo	<i>Vireo</i>	<i>gilvus</i>
	Willow Flycatcher	<i>Empidonax</i>	<i>trillii</i>
	Wilson's Warbler	<i>Wilsonia</i>	<i>pusilla</i>
	Yellow Warbler	<i>Dendroica</i>	<i>petechia</i>
Waterbirds	American Bittern	<i>Botaurus</i>	<i>lentiginosus</i>
	Eared Grebe	<i>Podiceps</i>	<i>nigricollis</i>
	Marsh Wren	<i>Cistothorus</i>	<i>palustris</i>
	Pied-billed Grebe	<i>Podilymbus</i>	<i>podiceps</i>
	Sora	<i>Porzana</i>	<i>carolina</i>
	Virginia Rail	<i>Rallus</i>	<i>limicola</i>
	Wilson's Phalarope	<i>Phalaropus</i>	<i>tricolor</i>
Waterfowl	Buffelhead	<i>Bucephala</i>	<i>albeola</i>
	Cinnamon Teal	<i>Anas</i>	<i>cyanoptera</i>
	Common Merganser	<i>Mergus</i>	<i>merganser</i>
	Northern Pintail	<i>Anas</i>	<i>acuta</i>
	Redhead	<i>Aythya</i>	<i>americana</i>
	Ring-necked Duck	<i>Aythya</i>	<i>collaris</i>
	Ruddy Duck	<i>Oxyura</i>	<i>jamaicensis</i>

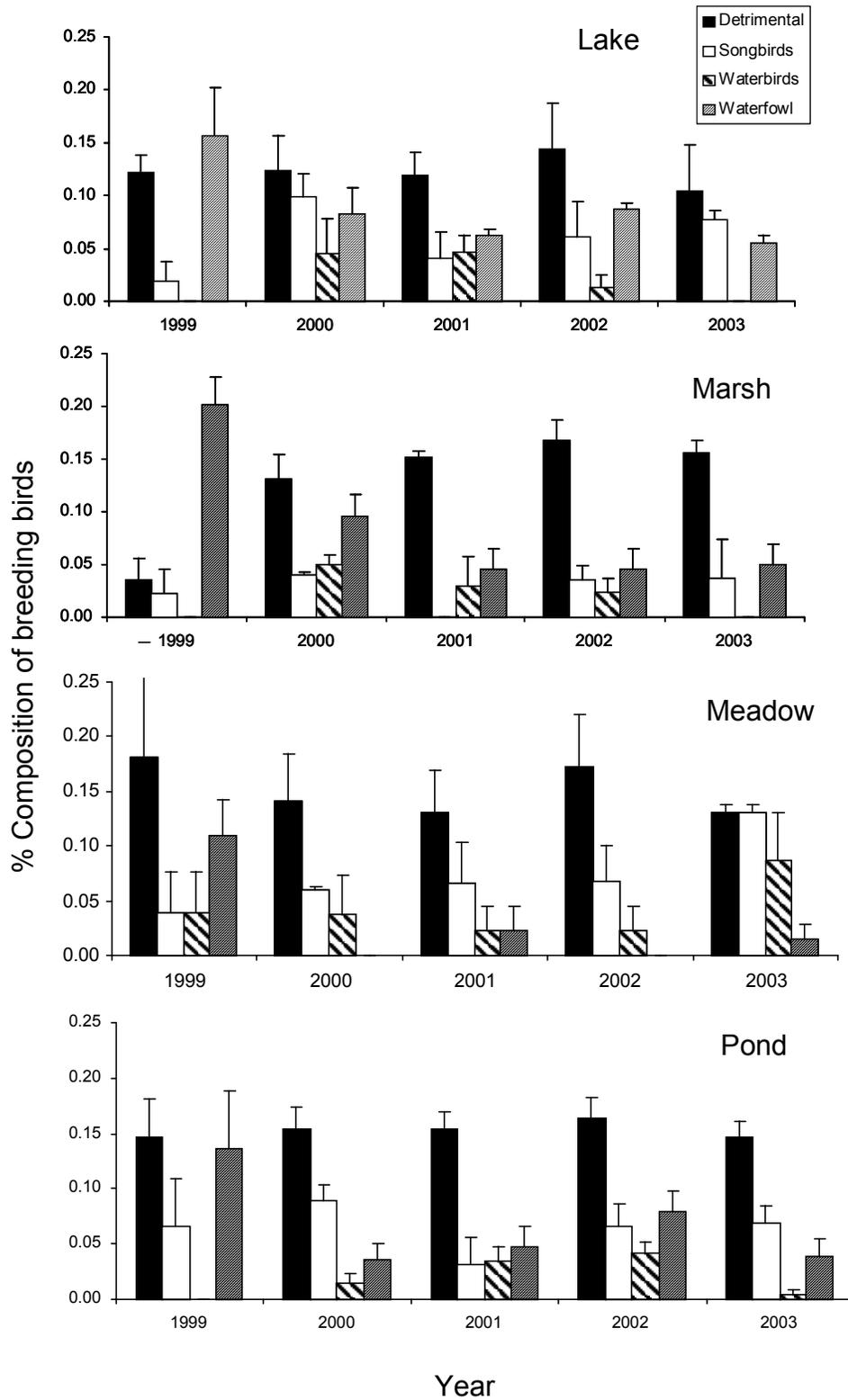
**Figure 7-5: The Number of Breeding Bird Species (mean  $\pm$  SE) Across Wetland Habitat Type and Year.**



Marshes consistently support a higher number of species than all other habitat types. Also, note that aside from 1999, the numbers of species are fairly consistent at each habitat type across years.

Detrimental species are the predominant bird assemblage across wetland types and years. This information strongly suggests that the waterfowl threshold is not in attainment with the non-degradation standard (Figure 7-6).

**Figure 7-6: The Relative Percent Composition of Breeding Birds (mean + SE) in the Lake Tahoe Basin by Wetland Habitat Type, Bird Assemblage, and Year.**

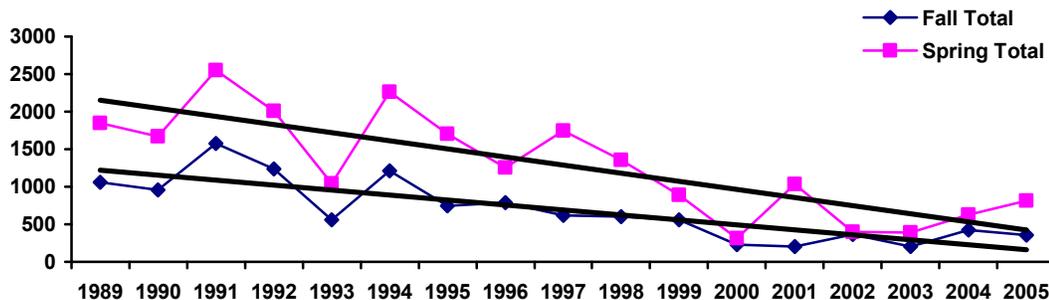


## Deer Non-attainment

Deer population numbers in the vicinity of the Tahoe region have been decreasing over time (Figure 7-7). TRPA's threshold (1986) identifies that meadows shall be protected as fawning habitat. There has been no direct loss of meadow habitat in the region in the last 5 years. In some cases (e.g., Meiss Meadow), grazing has been eliminated, which may result in improved conditions for deer. In other cases (e.g., Page Meadow), the quality of habitat for deer fawning has probably decreased as a result of increased intensity of recreational activity.

TRPA has limited opportunity to improve deer population numbers considering that factors associated with human population growth (i.e., reduced habitat quality and loss of habitat) are suspected as the major contributors to their decline and occur outside of the basin (NDOW 2004). Realistically, the Lake Tahoe Basin should not be expected to be a major contributor of fawning habitat due to its high elevation. Research is needed to evaluate the overall value of the Lake Tahoe Basin for fawning habitat and the efficacy of this threshold.

**Figure 7-7: Total Number of Deer Counted During Fall and Spring Counts in Nevada Division of Wildlife, Hunting Units 192, 194, and 196, Lake Tahoe Region, Nevada, 1989 to 2005 (Source: Carl Lackey, NDOW). Straight black line represents linear trend of deer count for each season.**



### **2006 Status Evaluation Relative to Threshold Attainment Schedules**

The contribution of compliance measures to threshold attainment and the achievement of interim targets are summarized in the Compliance Forms at the end of this chapter and Appendix A.

#### ***Threshold interim target status***

### ***Osprey***

This species is in attainment with the threshold standard of 4 population sites and has been since 1996. There were no interim targets set in 2001 for this species as it was in attainment at that time. There are no interim targets set for this species at this time as it is still in attainment.

### ***Bald Eagle (wintering and nesting)***

Conflicting land uses (recreational uses) still exist within disturbance (free) areas. Although annual winter Bald Eagle counts indicate stable numbers, nest production is below one active nest per year and declining. Therefore, the interim target set in 2001 to reduce recreation disturbance at wintering areas to a suitable level by 2006 has not been met.

Recommend retaining existing standards and indicators for nesting and wintering populations and habitat as interim target for 2011.

### ***Northern Goshawk***

Indicators show improved habitat conditions for species and improved reproductive success nearing species specific standard (albeit not at sites originally identified as Threshold Disturbance Zones). However, the interim target set in 2001 of improving disturbance (free) zone nesting habitat equivalent to 12 threshold sites by 2006 has not been met.

Recommend retaining existing species standard of 12 reproductively active sites be target for 2011 unless indicators and standards are amended during Regional Plan Update process. Recommend species be retained on TRPA SIS list.

### ***Golden Eagle***

Limited data were recorded for species between 2001 and 2006. Other USFS efforts indicated that species still occurs in southern portion of Upper Truckee watershed (as reported in 2001 Evaluation). The standard was not empirically reassessed as recommended as an interim target in the 2001 Evaluation Report. It is recommended that the species be removed from the list of Special Interest species. However, should the species not be removed from the list during the Regional Plan Update, the interim target would be the existing standard.

### ***Peregrine Falcon***

No evidence of species nesting in the basin has ever recorded (see Orr and Moffitt 1971). The standard was not empirically reassessed as recommended as an interim target in the 2001 Evaluation Report. It is recommended that the species be removed from the list of Special Interest species. However, should the species not be removed from the list during the Regional Plan Update, the interim target would be the existing standard.

### ***Waterfowl***

No additional measures or restrictions have been put in place on recreational access into waterfowl threshold sites. No deletions or additions to the list of threshold sites have been made. As a result, the interim target of reaching attainment by 2006 has not been met.

Recommend retaining standard of 18 threshold sites be interim target for 2011 unless current indicators and standards are amended during the Regional Plan Update process.

### ***Deer***

Population counts indicate a continued decline in deer numbers in the region; recreational activities continue to effect meadow habitat quality. Considering the

ubiquitous recreational access into meadow habitats, the non-degradation standard for meadow habitat will not likely ever be achieved. There has been no net loss of meadows but additional vegetation types (e.g., shrub dominated) have not been considered as suitable fawning habitat. Therefore the threshold was not attained by the 2006 interim target.

Recommend the remapping of fawning habitat within the basin to include other suitable habitats in addition to meadow habitat and assessment of the contribution of fawning habitat to the health of the Carson River and Truckee/ Loyalty deer herds as an interim target for 2011, unless current indicators and standards are amended during the Regional Plan Update process.

### ***Threshold target dates***

**Osprey** – Standard is in attainment at this time.

**Bald Eagle (nesting & wintering)** – Updated indicators and benchmarks are proposed as part of the Pathway process that more accurately measure the status of nesting and wintering Bald Eagle populations. If adopted, indicators would signify that the region is in attainment with the established benchmark.

**Northern Goshawk** – Updated indicators and benchmarks are proposed as part of the Pathway process that more accurately measure the status of nesting Northern Goshawk population in the basin. If adopted, indicators would signify that the region is in attainment with the established benchmark.

**Golden Eagle** – Standard is not likely to ever be in attainment, as nesting habitat in the region is suboptimal. The recommendation is to remove the species from the Species of Interest list.

**Peregrine Falcon** – Standard is not likely to ever be in attainment, as nesting habitat in the region is suboptimal. The recommendation is to remove the species from the Species of Interest list.

**Waterfowl** – The recommendation from the Pathway process is the use of waterfowl as part of a suite of indicators to be used to determine the status of wetlands and small lakes, in lieu of waterfowl as a Special Interest species. Should waterfowl not be removed as a Special Interest species it is unlikely that this threshold will ever be in attainment.

**Deer** – The non-degradation standard in meadow systems is not likely to ever be in attainment due to pre-existing and ubiquitous recreational use of meadows in the basin. The recommendation is to remove the species from the Species of Interest list.

## **7.3.2 W-2 HABITATS OF SPECIAL SIGNIFICANCE**

Please refer to Section 4.3.2 of the Soils chapter for an evaluation of the status of SC-2 Stream Environment Zones (relevant text begins on p. 4-17).

## 7.4 EIP IMPLEMENTATION STATUS

### 7.4.1 COMPLETED EIP PROJECTS AND CONTRIBUTION TO THRESHOLDS

At least 20 Environmental Improvement projects focused on improving wildlife habitat quality have been identified in the environmental improvement program. TRPA records indicate that 9 habitat enhancement projects have been completed to date (Table 7-6; see also Soils/SEZ Chapter for EIP Implementation status for riparian habitat.). In general, these projects have reclaimed previous lost wildlife habitat or have enhanced existing wildlife habitat condition. In some cases, it will take many years (up to 10 to 50 years) for wildlife populations to respond to these projects because it will take time for vegetation to grow and other processes to establish.

Additional programmatic, research and evaluation and regulatory projects have been completed that have resulted in an overall benefit to the wildlife program. Programmatic efforts to pursue grant funding for wildlife-related EIP projects have been undertaken and 15 of 21 research projects have been completed or are partially complete. In addition three of four projects to revise TRPA regulations related to wildlife have been completed since the inception of the EIP program. Efforts to review and revise wildlife disturbance zones are in progress and part of the Pathway 2007 planning effort.

The EIP program is currently in the process of being updated. Therefore, recommendations for projects directed toward meeting attainment of the wildlife thresholds will be made through that process.

**Table 7-6: List and Status of Completed Wildlife EIP Projects.**

EIP Number	Title	Project Description	Status
931	Old Growth Wildlife Habitat Enhancement/ Restoration – North Canyon	The objective of this project is to perpetuate old growth habitat conditions in 100 acres of North Canyon (Nevada State Parks). This will be achieved by mechanically treating even-aged white fir stands to create a structurally diverse (all tree ages represented) and species diverse stands.	Partially complete
932	Sugar Pine Recruitment and Old Growth Wildlife Habitat Enhancement	This project will promote sugar pine recruitment and the development of old growth characteristics in treated stands. Stands will be thinned by mechanical removal of selected small and medium diameter white fir trees; larger dbh stems will be retained. Following mechanical treatment, broadcast burning will be used to eliminate white fir seedlings and created openings for the germination of broadcast sugar pine seeds.	Partially complete

EIP Number	Title	Project Description	Status
1001	Snow Creek Wildlife Habitat Restoration	This project involves the restoration of a highly disturbed wetland complex. Activities include the removal of 25,000 cubic yards of contaminated fill, revegetation of 4 acres of wetland habitat, and restoration of 0.5 miles of stream and meadow to its natural function. This will increase cover of riparian wildlife habitat.	Completed
1003	Riparian Wildlife Habitat Enhancement – Phase I	Develop and implement a program to enhance and restore riparian habitat throughout the region. Target is to restore/enhance 5,090 acres of riparian habitat.	Partially complete
1004	Upland Wildlife Habitat Enhancement Program - Phase I	Develop and implement an upland wildlife habitat enhancement program to restore and or enhance upland habitat types. This includes restoring complexity and diversity to the region's forests through small selective cuts and prescribed burns.	Partially complete
10080	Aspen Community Restoration Projects	On a landscape scale, aspen communities provide for habitat diversity. This project is intended to build from the "Aspen community spatial distribution and condition assessment". Restoration projects will focus on deteriorating aspen stands. The project goal is to reestablish vigorous, self-sustaining, uneven aged aspen stands throughout the basin.	Partially complete
10083	Wildlife Habitat Restoration at Tahoe Basin State Parks – Phase -1	Project's objectives are to restore and enhance forest health, wildlife habitat, and habitat corridors along the west, north, and south shores of Lake Tahoe State Park lands. Project proposes to use small selective cuts, prescribed burning, road decommissioning, revegetation, and stream bank stabilization in upland forest, chaparral, and riparian vegetation on 50-300 acres at Burton Creek, Ward Creek, Sugar Pine Point, DL Bliss, Emerald Bay, and Washoe Meadows State Parks. 0.5-3 miles of roads and trails will be improved.	Completed
10085	Wildlife Habitat Restoration at Tahoe Basin State Parks – Phase III)	Project is a later phase of #10083 above.	Completed
10144	Lake Meadow Habitat Restoration	Project includes restoring the natural function to the meadow system and enhance riparian wildlife habitat. Full or partial restoration of Polaris Creek and adjoining marsh SEZ which was filled for creation of Pomin Park, up to 6 acres of wetland restoration will be completed.	Partially complete

## 7.5 THRESHOLD NEED FOR CHANGE

A major conclusion of this evaluation is that many of the current wildlife threshold standards, management standards and policies require re-evaluations for either recalibration or amendment. These changes also relate to updating the management system itself and coordination with other agencies. It is the recommendation of this report that TRPA should pursue the amendments to the environmental threshold carrying capacities developed and recommended as part of the Pathway 2007 process. The sections below summarize the proposed amendments. As noted amendments are scheduled for action with adoption of the Regional Plan package in 2008, while others will require further analysis by TRPA. The proposed changes include replacing the current value statements with specific threshold goal statements for Special Status Species and the biological integrity of aquatic and terrestrial ecosystems and the placing of these threshold goal statements under an all encompassing vision for fisheries and wildlife.

The following proposed Vision Statement and Threshold Goal Statements reflect the recommended basis for changing the existing threshold standard.

**Fisheries and Wildlife Vision:** Environmental conditions in the Lake Tahoe Basin support healthy and sustainable native terrestrial and aquatic animal populations and vegetation communities.

In addition to the vision statement, three separate threshold goals relating to wildlife were developed. They include:

**Threshold Goal 1: Biological Integrity of Terrestrial Ecosystems:** The functional, physical, chemical and biological integrity of the Basin's terrestrial ecosystem are maintained at or above a sustainable level.

The current habitats of special significance threshold (W-2) falls under this threshold goal.

**Threshold Goal 2: Sustainability of Special Status Species:** Populations of, and environmental conditions and processes important to native threatened, endangered, rare, special interest or sensitive species are maintained at a level which insures sustainability.

The current special interest species threshold (W-1) falls under this threshold goal.

**Threshold Goal 3: Biological Integrity of Aquatic Ecosystems:** The functional, physical, chemical and biological integrity of the Basin's aquatic ecosystem are maintained at or above a sustainable level.

The current habitats of special significance threshold (W-2) falls under this threshold goal.

## 7.5.1 W-1 SPECIAL INTEREST SPECIES

### Threshold Recommended Changes

The recommendation for this threshold is to use the Pathway 2007 process to change the standards and indicators for three existing Special Interest species, remove four others and add a new suite of species (Table 7-7).

**Table 7-7: Recommended TRPA Special Interest Species Based on Pathway 2007 Process**

Species	Reason for Recommendation
<b>Invertebrates</b>	
Lake Tahoe Benthic Stonefly	Endemic species, potential indicator of water clarity and deep water plant community health
<b>Birds</b>	
Bald Eagle	ESA, Threatened
Northern Goshawk	USFS Sensitive, indicator of forest health
California Spotted Owl	USFS Sensitive, indicator of forest health
Willow Flycatcher	USFS Sensitive, indicator of riparian habitat health
Yellow Warbler	State Species of Concern, indicator of riparian habitat health
Osprey	State Species of Concern, indicator of shorezone health
<b>Fish</b>	
Lahontan Cutthroat Trout	ESA, Threatened
<b>Amphibians</b>	
Mountain Yellow-legged Frog	USFS Sensitive, indicator of riparian habitat health
<b>Mammals</b>	
Trowbridge's Shrew	State Species of Concern, indicator of riparian habitat health
Mountain Beaver ( <i>Aplodontia rufa californica</i> )	State Species of Concern, indicator of riparian habitat health
Furbearing Mesocarnivores	
<ul style="list-style-type: none"> <li>• <b>American marten</b></li> <li>• Fisher</li> <li>• Wolverine</li> </ul>	USFS Sensitive, indicator of forest health

### Rationale for Change

The rationale for the additions to the Special Interest Species list, as well as the rationale for maintaining current species on the new list is illustrated in Table 7-7. The findings for these additions are that existing threshold standards are not sufficient or that additional threshold standards are required to maintain a significant resource value.

The rationale for removing species from the Special Interest species list are as follows:

**Golden Eagle and Peregrine Falcon** - Habitat suitability for both species in the region is marginal based on historic use and the region's high elevation relative to areas typically used by the two species within their range. The finding for the removal of these species from the Special Interest species is that substantial evidence to provide a basis for this threshold standard does not exist or that a threshold standard cannot be achieved.

**Waterfowl** –Should waterfowl not be removed as a Special Interest species it is unlikely that this threshold will ever be in attainment due to recreation and development impacts on threshold sites. The finding for the removal of these species from the Special Interest species list is that this threshold standard cannot be achieved.

**Deer** –The non-degradation standard in meadow systems is not likely to ever been in attainment due pre-existing and ubiquitous recreational use of meadow in the basin. The finding for the removal of these species from the Special Interest species list is that this threshold standard cannot be achieved.

## **7.5.2 W-2 HABITATS OF SPECIAL SIGNIFICANCE**

### **Threshold Recommended Changes**

During the 2001 to 2006 evaluation period, the W-2 threshold shared standards and indicators with SC-2, and as such was limited to riparian habitats. The recommendation for this threshold is to use the Pathway 2007 process to modify the standards and indicators of the W-2 threshold and incorporate these standards and indicators within the Biological Integrity of Terrestrial and Aquatic Ecosystems Desired Conditions (DC-1 and DC-3).

### **Rationale for Change**

The incorporation of the current W-2 threshold into the Biological Integrity of Terrestrial and Aquatic Ecosystems Desired Conditions will allow for the improved evaluation of riparian habitat as a habitat of special significance, while incorporating other special habitats in upland vegetation types not currently included under the existing threshold. The findings for these changes are that existing threshold standards are not sufficient or that additional threshold standards are required to maintain a significant resource value.

## **7.5.3 ALL THRESHOLDS**

### **Threshold Recommended Changes**

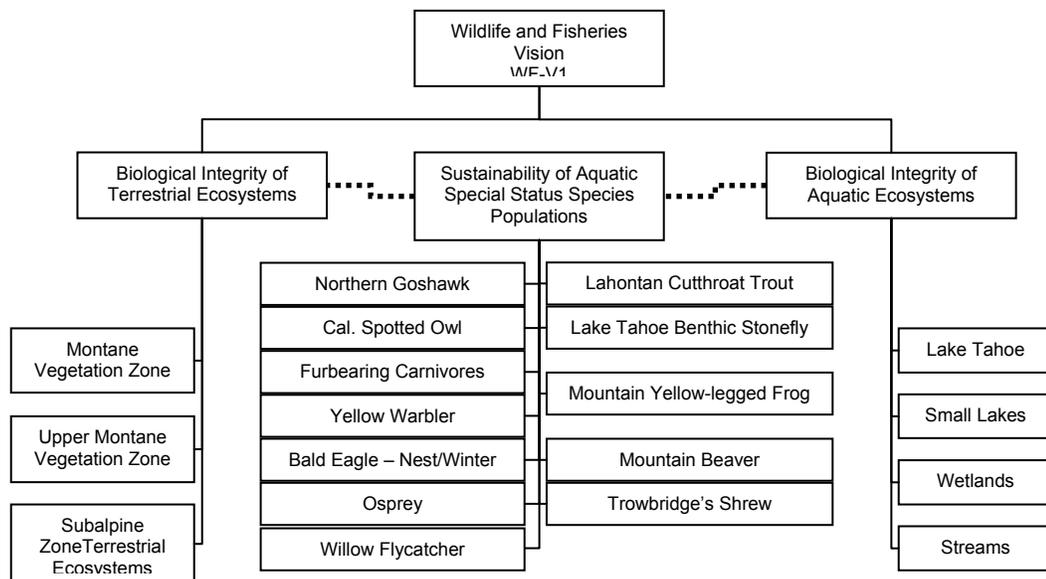
The Wildlife and Fisheries Core Working Group, as part of the Pathway 2007 process, has made a recommendation that, if adopted, will significantly change the way in which wildlife threshold standards and indicators will be evaluated in the future. The recommended combined threshold standard and indicator package for fisheries and wildlife resources shifts the primary focus away from traditional wildlife and fisheries management and strives to improve the biological integrity of aquatic and terrestrial ecosystems as well as recover listed wildlife and fish species. Fundamentally, recommended changes attempt to better recognize the interconnectedness of terrestrial and aquatic ecosystems for not only traditional wildlife and fish resources but for other important organism such as invertebrates,

amphibians, and aquatic reptiles, and other resources such as water and soils. Proposed Indicators to measure the biological condition of terrestrial and aquatic ecosystems are primarily based on the community of organisms that depend on the health or quality of these systems to be sustained overtime. The proposed changes challenge the existing “stove-pipe” or independent resource threshold evaluation approach (e.g., water quality, wildlife, fisheries, soil) by recommending that monitoring and evaluation be undertaken such that the different resources are considered concurrently just as should be done in order to assess the overall condition of the Lake Tahoe ecosystem.

Wildlife and fisheries desired condition statements were organized into three main branches stemming from the wildlife and fisheries vision statement (Figure 7-8, see also Pathway Technical Supplement). The first level of organization provides a regional vision of wildlife and fisheries resource condition. The vision statement identifies restoration and maintenance of biological integrity of the Lake Tahoe Basin as primary goals. In doing so, many statutory requirements are fulfilled as well as meeting goals for other resource areas, and the public.

Wildlife and Fisheries resource areas are currently recognized independently. Pathway 2007 proposes to change the way these resources are viewed by crafting desired condition statements based on the condition of aquatic and terrestrial ecosystems, the systems upon which wildlife and fish populations are dependent. The Wildlife and Fisheries Vision statement provides the foundation for desired conditions statements for the Biological Integrity of Aquatic and Terrestrial Ecosystems and the sustainability of Special Status Species (Figure 7-8). Branching from the wildlife and fisheries vision statements into aquatic and terrestrial ecosystems narrows the resolution of desired conditions to the landscape level of biological integrity, while Special Status Species focuses on the population level of biological integrity.

**Figure 7-8: Generalized Organizational Framework for Use in Developing Standards and Indicators for Biological Resources.**



In order to assess whether desired conditions and their related standards are being attained, an approach that provides indicators of condition at multiple spatial scales of interest is proposed: 1) the Lake Tahoe region, 2) ecosystem component (e.g., vegetation zone, streams, individual species of interest), and 3) sample site. For each desired condition there are related components (Table 7-8). For each component, a diagnostic indicator has been identified. For example, for the Special Status Species desired condition, species of interest are the components and the diagnostic indicators may reflect either: 1) presence/absence, 2) abundance, or 3) fecundity/productivity. Diagnostic indicators are essentially response variables to management activities and land use policy. For each component, a benchmark will be set that represents a level consistent with a sustainable or optimal biological condition, meets statutory requirements, and is consistent with the public's desires (Figure 7-9). A benchmark can be thought of as a point of reference below which conditions are not acceptable and above which conditions are acceptable and consistent with desired conditions. Progress is currently being made by the Core Working Group to identify benchmarks for each ecosystem or special status species component. Benchmarks will be based on field data, peer-reviewed literature and local reports, technical working group input, public input, and decision-maker input.

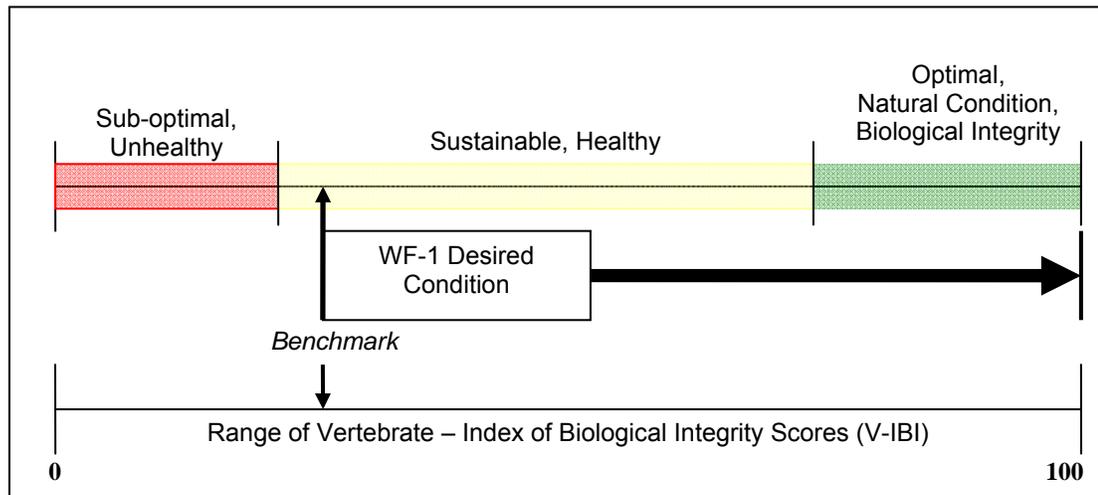
**Table 7-8: Components and Diagnostic Indicators for Wildlife and Fisheries Desired Conditions.**

Desired Condition	Component	Diagnostic Indicator(s)
<b>Biological Integrity of Terrestrial Ecosystem</b>	Montane Vegetation Zone	<ul style="list-style-type: none"> <li>• Vertebrate – Index of Biological Integrity (V-IBI). Based on small mammal, bird, and medium to large mammal community characteristics</li> </ul>
	Upper Montane Vegetation Zone	
	Subalpine Vegetation Zone	
<b>Sustainability of Special Status Species</b>	List of Special Interest Species (each assigned to appropriate diagnostic indicator)	<ul style="list-style-type: none"> <li>• Productivity</li> <li>• Abundance</li> <li>• Presence/Absence</li> </ul>
<b>Biological Integrity of Aquatic Ecosystems</b>	Streams	<ul style="list-style-type: none"> <li>• Benthic Macroinvertebrate – Index of Biological Integrity (B-IBI)</li> <li>• Biological Pollution Index</li> </ul>
	Wetlands	<ul style="list-style-type: none"> <li>• Waterbird Index of Biological Integrity (W-IBI)</li> <li>• Herpetological Index of Biological Integrity (H-IBI)</li> <li>• Biological Pollution Index</li> </ul>
	Lake Tahoe	<ul style="list-style-type: none"> <li>• Zooplankton Assemblage</li> <li>• Biological Pollution Index</li> <li>• Catch Per Unit Effort</li> <li>• Littoral Fish Life History Index</li> <li>• Lake Clarity</li> </ul>
	Small Lakes	<ul style="list-style-type: none"> <li>• Waterbird Index of Biological Integrity (W-IBI)</li> <li>• Herpetological Index of Biological Integrity (H-IBI)</li> <li>• Biological Pollution Index</li> </ul>

In addition to diagnostic indicators, “attribute indicators” have been identified, and are currently being developed. These attribute indicators relate to the ‘attributes’ of desired conditions. Like diagnostic indicators, attribute indicators are measurable parameters which can be important in understanding whether a desired condition is being achieved. For each attribute indicator, a benchmark will be consistent with the desired condition. Benchmarks have not yet been set for attributes; additional technical and public input will be required. Thus, the attainment of diagnostic and attribute benchmarks will largely determine attainment of the desired conditions and related standards for wildlife and fisheries resources.

The proposed approach is a considerable improvement over the existing approach to measure biological conditions because it provides a more thorough review of biological conditions. Because more biological parameters are measured it will be possible to identify which biological parameters are not attaining desired conditions and where (if any) on the landscape degradation exists.

**Figure 7-9: Terrestrial Ecosystem Diagnostic Indicator – Montane Vegetation Zone example.** A diagrammatic representation (adapted from Karr and Chu, 1999) of the relationship of the diagnostic indicator to the desired condition as applied to a terrestrial ecosystem component (e.g., Jeffrey Pine Dominated Forest Type). A benchmark based on the range of Index of Biological Integrity scores would demarcate where conditions are in attainment with the desire condition for that component. An IBI score can be generated for each sample site.



These recommended changes will go into effect following the completion of the Pathway 2007 process and adoption of the revised Region Plan by the TRPA Governing Board.

## **General Rationale for Change**

The standards for this threshold are not supported by substantial evidence, cannot be achieved, and are not sufficient to maintain the intended resource values (cf. criteria 4b, 4c, and 4d of Resolution 82-11). The current Special-Interest Species list is not inclusive enough to provide management direction for several species that are threatened to some degree. At the same time, two species and two species groups now on the list do not warrant special protection.

Several opportunities exist to improve the way environmental conditions are evaluated in the Lake Tahoe Basin including:

- Reduce indicator evaluation redundancy by improving the evaluation framework. Avoid measuring the same things differently (e.g., Stream Environment Zone (SC-2), Riparian Habitat (W-2), and Stream Habitat (F-2)).
- Identify threshold standards that are based on real data and are attainable. This finding implies that current threshold standards may not be achievable.
- Select indicators that effectively and efficiently measure environmental conditions and respond to land management and policy (See also Tracy and Barrett 2005). This finding implies that existing threshold standards are not sufficient or that additional threshold standards are required to maintain a significant resource.
- Identify and adopt standardized field monitoring and evaluation protocols to reduce subjective threshold standard attainment determinations.
- Fund the implementation of adopted standardized monitoring and evaluation protocols.

### ***Indicators***

The following is a general summary of the need for change for existing indicators.

- The statistical behavior of existing indicators is not adequately understood or documented. It is unknown if existing indicators vary with natural environmental variation or whether they are responsive to or indicative of management actions and policies put forth by participating management agencies. Ultimately, indicators that are selected for this current effort need to vary with the activities that various agencies are responsible for regulating (e.g., development) or managing (e.g., recreation). The bottom line is that it needs to be known how people and management actions are affecting biological resources in order to better inform the conservation of Lake Tahoe's biological resources.
- Many indicators are based on subjective determinations (e.g., criteria to judge stream habitat conditions) and may be biased to a specific group of biota (e.g., trout species, birds of prey). Indicators and the means to measure them need to be carefully and clearly articulated such that there is

no room for variation in interpretation from one agency to the next, or one individual to the next. Consequently, the development of comprehensive monitoring and evaluation protocols concurrently with environmental quality indicators is critical to ensure that monitoring and evaluation bias, as a result of subjective measurements, is reduced to greatest extent possible.

- Existing indicators primarily measure surrogates of biological condition (e.g., littoral lake substrate) rather than biota itself to determine condition. A direct measure of biota does not allow room for anecdotal interpretation of biological conditions. If surrogates of biological condition are proposed, surrogates measures should statistically describe the strength of their measure to biological condition (e.g., How strong is the relationship between the acreage of littoral substrate types and the health of different fish species populations or, more broadly, the condition of the aquatic biota?).
- Existing indicators are categorized either by agency or resource (or threshold) area and evaluated independent of each other. Consequently, inherent ecological relationships can go undetected (e.g., soil, vegetation, wildlife) and monitoring efficiency is lost.
- Multiple threshold (resource) categories may address related or even identical targets differently (e.g., existing indicators for SEZ, stream habitat, riparian habitat, and tributary water quality).

### **Standards**

These, new or modified indicators will require that associated standards are updated concurrently.

- “Non-degradation” standards are meaningless without providing a reference condition to measure divergence from the desired state. There are many examples where “non-degradation” standards (e.g. TRPA’s non-degradation of riparian habitat) that exist in planning documents could be improved by applying quantifiable reference parameters to compare degraded conditions to.
- Assumptions that formed the basis of many of the original standards are unsupported by new information (e.g., supporting a population of Peregrine Falcon). As a result some standards are not achievable because they are based on ambiguous or unsupported information.
- Achievement of non-numeric standards is open for interpretation and achievement determination is not necessarily repeatable by different evaluators (e.g., Govern Board support of a particular policy such as the reintroduction of LCT populations).
- New regulations (such as the National Forest Management Act (NFMA) 2005), will require partner agencies to update environmental targets (e.g., USFS Special Interest Species) and thus the TRPA standard should also be adjusted to be consistent.

- Some standards are poorly articulated (e.g., no definition of wildlife “population sites” provided in planning documents). Providing a clear record of vocabulary is critical for all to understand and interpret.

## 7.6 RECOMMENDATIONS

### 7.6.1 ALL THRESHOLDS

#### Status of the 2001 Threshold Recommendations

**Table 7-9: Status of the 2001 Threshold Recommendations**

Recommendation	Comments	Status
Special interest species – Update threshold standards and indicators	Conduct a comprehensive evaluation of TRPA’s existing threshold standards and threshold indicators for special interest species. Evaluation shall make recommendations for new standards and indicators or improvements to existing standards and indicators based on the most applicable science, information specific to the Lake Tahoe Basin, and habitat models. All proposed threshold standards and indicators shall be measurable, scientifically defensible, and attainable. The evaluation shall also include recommendations for monitoring.	Completed as part of the Pathway 2007 process. See Wildlife and Fisheries Technical Supplement for more detail.
Habitats of special significance – Update threshold standards and indicators	Conduct a comprehensive evaluation of TRPA’s existing Threshold standards and indicators for habitats of special significance. Evaluation shall make recommendations for new standards and indicators or improvements to existing standards and indicators based on the most applicable science, information specific to the Lake Tahoe Basin, and habitat models. All proposed threshold standards and indicators shall be measurable, scientifically defensible, and attainable. The evaluation shall also include recommendations for monitoring.	Completed as part of the Pathway 2007 process. See Wildlife and Fisheries Technical Supplement for more detail.

Recommendation	Comments	Status
Public outreach wildlife website	Establish a Public Outreach Program that creates and maintains a Wildlife Awareness Web Site. The web site should have a live feed 'Web Camera' at nests (e.g., Osprey) or significant wildlife use areas (e.g., Taylor Creek Marsh). Will provide public the opportunity to view sensitive wildlife and gain greater appreciation for their conservation.	Partially complete with the implementation of www.tiims.org, Wildlife and Fish sections could use some improvements.
Adopt limited operating periods for special interest species	Adopt limited operating periods for TRPA Special Interests Species, and other agency sensitive species. Policy would restrict impacting activities and projects to outside of critical periods.	Will be completed as part of the Pathway 2007 process. See Wildlife and Fisheries management strategies.
Bear-proof trash container requirement	Adopt an ordinance requiring bear-proof trash containers on new projects and projects with significant modifications. This should especially apply to recreation facilities such as campgrounds and day use areas. Ordinance will assist in controlling wildlife (such as bear, coyote, domestic dogs and raccoon) dependency on human generated waste.	Completed. TRPA signed MOUs with local jurisdictions and created "no coverage" incentives to install bear-proof containers.
Bald eagle wintering habitat improvement	Work with USFS to enforce closure of wintering area at Taylor Creek, install temporary fencing around core wintering areas, and improve signage at Bald Eagle wintering areas to reduce and eliminate impacts to bald eagle from human activity during winter months. Product: Installation of temporary fence (between October and March) at Taylor Creek Marsh.	Not complete
Wetland habitat improvement assessment	Systematically assess existing trails and roads that bisect wetlands and identify opportunities that more appropriately direct and buffer human activity away from the periphery and interior of wetlands. This can be accomplished by realigning existing trails away from or outside of wetland areas, designating wetland areas as preserves, and limiting access into wetlands, establishing native riparian shrub and tree vegetation along the periphery of wetlands to hamper access, and design observation platforms to serve as blinds and interpretive opportunities. In doing so, the public still has access to wetlands, yet their impact is reduced considerably.	Not Complete

### **Recommended changes for 2006**

The recommendations for changes to wildlife thresholds are described in section 7.5 and also included in the Draft Pathway 2007 Evaluation Report (Version 1.1, 2006) and Technical Supplement. Some of the recommended changes will be addressed in the 2008 Regional Plan Update. The specific changes to be brought forth in the update will be evaluated in an Environmental Impact Statement to be completed before public hearings and requests for Governing Board action. The Compliance Measure updates listed in this document are intended to provide new information on monitoring, interim targets and to correct previous grammatical and factual errors. Potential changes to threshold standards and indicators will be addressed in the Threshold Update portion of the EIS for the Regional Plan Update.

It is therefore recommended that existing compliance measures and supplemental measures (identified in the 2001 Threshold Evaluation) for wildlife are observed until Pathway 2007 recommendations are adopted.

### **Implementation of supplemental compliance measures.**

No additional supplemental compliance measures are recommended at this time.

### **Modification or deletions of past compliance measures.**

No modifications or deletion of past compliance measure are recommended at this time.

## 7.7 REFERENCES

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### ***Personal communication***

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**Category: wildlife**  
**Parameter: special interest species**

- STANDARD: Provide a minimum number of population sites and minimum disturbance zone for the following species or species groups. Nest sites and perch sites shown on TRPA Regional Plan Overlay Maps or in TRPA Geographic Information System shall not be physically disturbed, nor shall the habitat in the disturbance zone be manipulated in any manner, unless necessary to enhance the quality of the habitat (TRPA Code, Chapter 78, Subsection 78.3.A).

Species of Interest	Population Sites	Disturbance Zone
Northern Goshawk	12	0.50-mile radius
Osprey	4	0.25 mile radius
Bald Eagle (winter)	2	Mapped areas
Bald Eagle (nest)	1	0.50 mile radius
Golden Eagle	4	0.25 mile radius
Peregrine Falcon	2	0.25-mile radius
Waterfowl	18	Mapped areas
Deer	--	Meadows

- INDICATOR (UNITS): The minimum number of population sites (areas for reproductive activity or wintering habitat) and disturbance (free) zones maintained as determined by inspection by qualified wildlife experts using measures of reproductive activity or habitat quality .
- MONITORING SUMMARY: Monitoring consists of an ongoing collaborative program between TRPA, the Forest Service, Nevada Division of Wildlife, California Department of Fish and Game, and California State Parks . Annual surveys were conducted according to established protocols at known population sites and within suitable habitats of special interests species and other sensitive species. The majority of population sites occurred on lands managed by California and Nevada state parks and US Forest Service. Prior to the issuance of a permit for any particular activity that would occur within the disturbance (free) zone, a habitat impact assessment is conducted by TRPA staff or other qualified wildlife biologist.
- ATTAINMENT STATUS ~~(2001)~~ (2006):  
 Goshawk: non-attainment, near attainment  
 Osprey: attainment  
 Bald eagles (winter): non-attainment, near attainment

Bald eagles (nesting): attainment non-attainment  
 Golden eagle: non-attainment unknown  
 Peregrine falcon: non-attainment Not Known  
 Waterfowl: non-attainment  
 Deer: non-attainment

- TARGET DATE: See INTERIM TARGETS, below
- EVALUATION INTERVAL: Five years
- INTERIM TARGETS:
  - Bald Eagle (nesting & wintering) – reduce recreation disturbance at wintering areas to suitable levels ~~by 2006~~. Conflicting land uses (recreational uses during critical wintering period) still exist on USFS and CTC wintering areas. However, annual winter Bald Eagle counts indicate stable numbers. Recommend retaining existing standards and indicators for nesting and wintering populations and habitat as interim target for 2011 unless amended during the Regional Plan update process.
  - Goshawk – Not likely to ever be achieved at original threshold sites considering level of recreation activity/development permitted within TRPA mapped disturbance (free) zones. ~~Overall however, with USFS and State Park road decommissioning projects, will likely improve disturbance (free) zone nesting habitat equivalent to 12 threshold sites by 2006.~~ Indicators show improved condition for species, improved reproductive success, and USFS road decommissioning project improving habitat conditions. Recommend retaining existing species standard of 12 reproductively active sites be target for 2011 unless indicators and standards are amended during Regional Plan update process.
  - Golden Eagle – standard not likely to ever be achieved in the Lake Tahoe basin due to suboptimal nesting habitat in the region. Standard should be re-assessed. Limited data recorded for species between 2001 and 2006. Other USFS efforts indicated that species still occurs in southern portion of Upper Truckee watershed. Recommend further evaluation.

- d. Peregrine Falcon – standard not likely to ever be achieved in the Lake Tahoe basin due to suboptimal nesting habitat in the region. Standard should be re-assessed. No evidence of species nesting in the basin ever recorded (see Orr and Moffitt 1971). Recommend further evaluation.
  - e. Waterfowl – non-degradation standard not likely to be achieved at ‘threshold sites’ due to continued demand for recreation access into wetland interiors. If greater recreation access restrictions are applied and additional sites considered for ‘threshold site’ status, standard will be achieved by ~~2006~~2011. Recommend retaining standard of 18 threshold sites be interim target for 2011 unless current indicators and standards are amended by Regional Plan update process.
  - f. Deer – considering the ubiquitous intrusion by recreationists into meadow habitats, the non-degradation standard for meadow habitat will not likely ever be achieved. ~~If additional suitable fawning habitats are considered (e.g., shrub dominated), threshold standard will likely be achieved by 2006.~~ Population counts indicate a continued decline in deer numbers in the region. Recommend the remapping of fawning habitat within the basin to include other suitable habitats in addition to meadow habitat and assessment of the contribution of fawning habitat to the health of the Carson River and Truckee/Loyalton deer herds as an interim target for 2011 unless current indicators and standards are amended by Regional Plan update process.
8. COMPLIANCE MEASURES: (See **Section II Appendix A** for inventory)
- a. MEASURES IN PLACE: WILDLIFE-- 149, 150, 151, 152, 153, 154, and 155.
  - b. EFFECTIVENESS OF MEASURES IN PLACE: In general compliance measures in place are effective. ~~Refer to Table 7.6 for a complete evaluation of compliance measures in place.~~
  - c. SUPPLEMENTAL MEASURES: Supplemental measures 156 and 157 (identified in 1996 Threshold Evaluation) were assessed in Table 7.6. in the 2001 Threshold Evaluation). Recommend the implementation of Environmental Improvement Projects for Wildlife, Fisheries, and SEZ as new supplemental measures.
- d. EFFECTIVENESS OF SUPPLEMENTAL MEASURES: 1996 Threshold Evaluation supplemental measures were evaluated in Table 7.6 of ~~this document~~the 2001 Threshold Evaluation. Implementation of EIP projects for wildlife, fisheries, and SEZ will significantly contribute to the improvement of habitat quality for Special Interest Species.
9. ADEQUACY OF COMPLIANCE MEASURES: In general, compliance measures are adequate.

**Category: Wildlife**

**Parameter: Habitats of Special Significance**

1. STANDARD: A non-degradation standard shall apply to significant wildlife habitat consisting of deciduous trees, wetlands, and meadows while providing for opportunities to increase the acreage of such riparian associations.
2. INDICATOR (UNITS): Area of naturally functioning SEZs (acres).
3. MONITORING SUMMARY: See SC-2 (Chapter 4).
4. ATTAINMENT STATUS: See SC-2 (Chapter 4).
5. TARGET DATE: See SC-2 (Chapter 4).
6. EVALUATION INTERVAL: See SC-2 (Chapter 4).
7. INTERIM TARGETS: [Recommend continued use of See SC-2 targets unless W-2 threshold indicators and standards are amended during Regional Plan update process. \(Chapter 4\).](#)
8. COMPLIANCE MEASURES:
  - a. MEASURES IN PLACE: See SC-2. In addition, Wildlife - 149, 150, 151, 153, 154, and 155.
  - b. EFFECTIVENESS OF MEASURES IN PLACE: In general, measures in place are effective
  - c. SUPPLEMENTAL MEASURES: See SC-2
  - d. EFFECTIVENESS OF SUPPLEMENTAL MEASURES: See SC-2.
9. ADEQUACY OF COMPLIANCE MEASURES: See SC-2.